DOCUMENT RESUME

ED 121 217 HE 007 678

TITLE Persisters and Withdrawals: An Analysis of the Differences.
INSTITUTION Research Medical Center, Kansas City, Mo. School of Nursing.
PUB DATE 75
NOTE 20p.

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage
DESCRIPTORS Academic Achievement; College Entrance Examinations; Dropouts; Grade Point Average; Grade Prediction; *Higher Education; Medical Education; *Nursing; *Persistence; Predictive Measurement; Student Evaluation; Student Interests; *Student Motivation; Superior Students; *Withdrawal
IDENTIFIERS *University of Missouri Kansas city

ABSTRACT

In a study of ways to improve the quality of education offered by the School of Nursing and to provide a data base for future studies, the reasons for persistence or withdrawal of the Class of 1975 are examined. The variables examined included: high school rank, University of Missouri-Kansas City grade point average, and the academic and nonacademic measures on the Psychological Corporation's Entrance Examination for Schools of Nursing. The persisters group was composed of 61 members of the class; the withdrawal group, 24 members. There was no significant difference in average high school rank between the groups. The persisters had a significantly higher UMKC grade point average and significantly higher mean scores on two of the seven measures of academic ability on the Psychological Corporation exam. The discriminant function significantly differentiated between members of the criterion group (Class of 1975) and the cross-validation group (Class of 1976). In general, the results tended to support previous studies regarding the use of measures of academic achievement/ability in predicting success, or persistence in school, but the results did not support previous findings based on the use of measures of nonacademic variables. Recommendations are offered. (Author/LBH)

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ED121217

PERSISTERS AND WITHDRAWALS: an analysis of the differences

GRANT NO. 1E04 NU00714-01

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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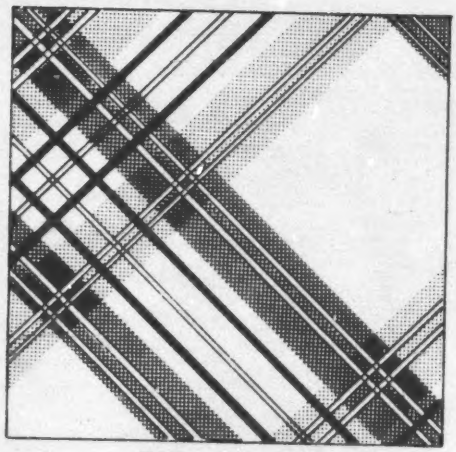

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PREFACE

This study was one of a series of projects undertaken as part of Nursing Capitation Grant #1E 04 NU00714-01 awarded Research Medical Center School of Nursing.

The purpose of these studies is to provide information to aid in improving the quality of education offered by the School of Nursing and to provide a data base for future studies.

The studies are being conducted by the School of Nursing. The project staff includes: Dr. Teresa L. Mitchell, Director, School of Nursing and Project Director; Clifford B. Tatham, Coordinator, Special Grants and Projects; and Mary H. Proctor.

This report describes the procedures and findings of the study of the Persisters and Withdrawals of the Class of 1975. Additional information may be obtained by contacting the Coordinator, Special Grants and Projects.

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PERSISTERS AND WITHDRAWALS: AN ANALYSIS OF THE DIFFERENCES

The problem of student attrition is not unique to schools of nursing or related health fields. However, when viewed from the perspective of society's needs for more trained personnel to meet its health needs, then student attrition may be seen as a major problem. A common solution to the problem of student attrition is to increase the enrollment (Knopf, 1972). Such a solution does not explore, nor attempt to determine the whys of attrition.

A search of the literature related to student attrition in schools of nursing revealed a paucity of published studies based on data obtained from students in diploma programs. The majority of studies dealing with student attrition or prediction of academic and/or clinical success tended to utilize students in collegiate programs. As might be expected, there were articles which dealt with the use of traditional academic predictors, i.e. examination scores, high school rank, etc. and those that utilized non-academic predictors such as personality measures, socio-economic status, etc.

Examples of studies conducted in diploma school settings included those by Plapp, Prathas, and Caputo (1965); Thurston, Brunclik, and Feldhusen (1969); Miller (1974); Burton (1972); and Adams and Klein (1970). Plapp, Prathas, and Caputo (1965) reported that intellective factors were useful in predicting first year attrition, but did not appear to be useful in predicting second year attrition.

Thurston, Brunclik, and Feldhusen (1969) reported on the validation of two new instruments for use in the selection of nursing students. Their population was composed of 463 students at eight hospital-based diploma schools of nursing. They reported significant differences between students "in school" and "not in school" on some of the subtest scores. The instruments employed were a sentence completion blank and an attitude inventory.

Miller (1974) conducted a follow-up study of 236 students who withdrew from six schools of nursing in the state of Tennessee. The six schools included two diploma schools, three associate degree programs, and one baccalaureate degree program. The major findings were: 1) the diploma schools had the highest percentage of dropouts (42%), followed by associate degree programs (35%), and baccalaureate programs (20%); 2) the major reason for withdrawing was academic difficulty; and 3) 28% had re-entered a nurse training program.

Burton (1972) employed discriminant analysis to determine agreement between academic and personality ratings using Cattell's Sixteen Personality Factors Test. The subjects were nursing students in England. The prediction was statistically significant as was the cross-validation.

Adams and Klein (1970) reported on the consistency of personality characteristics of student nurses as measured by the Edwards Personal Preference Schedule (Edwards, 1959), and noted that several changes had occurred which apparently re-

flected general changes in nursing students' attitudes over a 10-year period.

This present study was undertaken to discern those variables which might differentiate between the members of the Class of 1975 who persisted in, and those who withdrew from, the School of Nursing during the 1973-1974 school year. In addition to discerning differences between the groups, a prediction equated utilizing discriminant analysis was also done.

METHODOLOGY

The 85 students in this study included 61 members of the Class of 1975 who were still enrolled in the School of Nursing in January, 1975, and 24 members of the class who had withdrawn during the 1973-1974 academic year. The 61 who persisted in their studies had matriculated in the School as Freshmen in September, 1972. The 24 withdrawals included five students who had been admitted to the School at the beginning of the Junior year.

The variables employed in this study included: High School Rank; University of Missouri-Kansas City grade-point-average; and the Psychological Corporation's Entrance Examination for Schools of Nursing. The latter is composed of six subtests and yields six subtest scores and a total score. The total score is a composite of four subtests: Verbal Ability; Numerical Ability; Science; and Reading Skills. The pre-entrance examination also contains a 150-item personality inventory which comprises six scales adapted from the Edwards Personal

Preference Schedule (EPPS): Achievement, Order, Persistence, Congeniality, Altruism, and Respectfulness.

The statistical technique analysis of variance was employed to determine mean differences between the two groups of students in this study. The discriminant analysis statistical technique was employed in the development of a prediction equation. This technique permits the prediction of a dichotomy from several numerical variables. That is, it would permit the user to predict whether a student is more like those who persisted or those who withdrew from school.

RESULTS

As may be seen in Table 1, the major reason for withdrawing from the School of Nursing was 'Academic'. One-half of those who withdrew did so for 'Personal' or 'Health' reasons. Included under these latter headings were withdrawal for marriage and pregnancy.

Table 1

Reasons for Withdrawal from School

Reason	Frequency	Percent
Academic	9	37.5
Personal	6	25.0
Health	6	25.0
Change of Interest	3	12.5

Table 2 shows the means, standard deviations, and F-ratios for the nine measures of academic ability/achievement. The Persisters had significantly higher means on three of the nine

Table 2

Summary of Means and Standard Deviations for Persisters and Withdrawals and F-ratios Between Groups

	Persisters	Withdrawals	F-ratios
High School Rank			
Mean	56.75	53.77	3.64
SD	6.29	6.23	
UMKC GPA			
Mean	2.84	2.49	10.23**
SD	.46	.24	
Verbal Ability			
Mean	62.38	59.67	<1.00
SD	13.13	9.40	
Numerical Ability			
Mean	43.97	41.58	1.06
SD	10.02	7.86	
Science			
Mean	52.84	49.04	3.47
SD	8.32	8.42	
Arithmetic Processes			
Mean	21.41	20.00	2.13
SD	5.55	4.34	
Reading Skill			
Mean	32.24	29.96	8.78**
SD	2.92	4.24	
General Information			
Mean	52.90	48.08	6.59*
SD	9.19	9.55	
Total			
Mean	191.28	180.25	3.66
SD	23.95	23.79	

*p<.05
**p<.01

measures: UMKC grade-point-average, the Reading Skills, and General Information subtests of the pre-entrance examination. In addition, the Persisters tended to have higher means on the other six measures.

Table 3 contains the means, standard deviations, and F-ratios for the six non-academic measures. As may be seen, there were no significant differences between the groups on these measures. It was interesting to note that the Withdrawal group had a slightly higher means score on the non-academic measure that tended to approach significance: Achievement.

Table 3

Means, Standard Deviations, and F-ratios for the Personal Preference Schedule Scales

Scale	Persisters	Withdrawals	F-ratio
Achievement			
Mean	12.59	14.04	3.48
SD	3.07	3.62	
Order			
Mean	10.51	12.21	2.07
SD	4.52	5.81	
Persistence			
Mean	12.33	13.04	<1.0
SD	4.14	3.83	
Congeniality			
Mean	17.24	17.40	<1.0
SD	4.21	3.22	
Altruism			
Mean	16.77	16.08	<1.0
SD	4.56	4.19	
Respectfulness			
Mean	10.52	10.96	<1.0
SD	3.18	3.67	

The Reading Skill and General Information subtests of the pre-entrance examination were used in the development of the discriminant function because of the significant difference between the mean scores for the groups. The analysis yielded the following discriminant function: $v = .001182X_1 + .000465X_2$ where v is the cut-off point; X_1, the Reading Skill raw score; and X_2 the General Information raw score. The optimum cut-off point between the two groups was v = .060451. Thus, any student whose discriminant function yielded a value of more than .060451 was more likely to resemble students who persisted in school than those who withdrew from school. The UMKC grade-point-average was not used because the concern was to predict potential persisters before enrollment or during their first semester in the School of Nursing. Thus, if a student appeared to be a potential withdrawal, appropriate steps could be taken to assist the student in successful completion of his/her program.

When the above equation was applied to the criterion group, 19 Persisters and 10 Withdrawals were incorrectly identified. Table 4 shows that the relationship between the predicted and actual behavior was significant.

Whenever possible, a prediction equation should be cross-validated. That is, it is necessary to demonstrate that the prediction holds for another population. In this particular instance the equation developed on the Class of 1975 was applied to the Class of 1976. The result of the cross-validation is shown in Table 5. The relationship between predicted and actual status in school was significant.

Table 4

Relationship Between Predicted and Actual School Status for Criterion Group (Class of 1975)

	Actual Status		
	Persisters	Withdrawals	Total
Predicted Status			
Persisters	42	10	52
Withdrawals	19	15	34
Total	61	25	86

$\chi^2 = 5.027$; df = 1; $p<.05$

Table 5

Relationship Between Predicted and Actual School Status for Cross Validation Group (Class of 1976)

	Actual Status		
	Persisters	Withdrawals	Total
Predicted Status			
Persisters	59	5	64
Withdrawals	41	17	58
Total	100	22	122

$\chi^2 = 8.114$; df = 1; $p<.01$

DISCUSSION

The purpose of this study was to determine what differences, if any, existed between those students who withdrew from the School of Nursing and those who persisted in their studies. The results of the measures of academic achievement and ability are shown in Table 2, and the results of the non-academic measures are shown in Table 3. As may be seen in

these tables, the major differences between the two groups of students tended to be in the general area of academic achievement and ability.

One of the requirements for admission to the School of Nursing is that the applicants must rank in the upper half of their high school classes. The fact that all students in this study had been admitted to the School provides a partial explanation for the non-significant difference between the groups with respect to average high school ranks.

There was no apparent explanation for the significant difference between the groups with respect to their mean University of Missouri-Kansas City grade-point-average. It may be that those students who persisted in their studies may have achieved higher grades in the two required science courses--Anatomy and Physiology and Microbiology. If the persisters did achieve higher grades in these courses, such achievement would provide some explanation for the difference obtained.

As mentioned previously, there were few studies which used students who were enrolled in diploma programs. Furthermore, none of the studies reviewed utilized the Psychological Corporation's examination. The structure of this examination permitted analyses of the various aspects of academic achievement and ability. There was no significant difference between the groups on the Total score or on three of the four subtests that comprise the Total score: Verbal Ability, Numerical Ability, and Science. A significant difference was obtained on the Reading Skill subtest which is used in deriving the Total score.

Because of the nature of a nursing education curriculum, a difference between Persisters and Withdrawals on the Science subtest might have been expected. Since this subtest was designed to measure a broad range of science information, it may not have been sensitive to specific areas which might have differentiated the groups. However, the F-ratio for this subtest, while not statistically significant, tended to approach a level of significance which tended to suggest that it might be of value in future prediction studies.

Previous reasearch, based on the National League for Nursing's Pre-Entrance and Guidance Examination, has shown a significant difference between graduates and withdrawals (Bruton, 1954). Although the Psychological Corporation's examination and the NLN examination are different, it might be assumed that both instruments measure similar reading skills. The findings reported by Bruton (1954) and Meyer (1959) suggested that the difference obtained in the present study on the Reading Skill subtest should have been expected.

These results also tended to suggest that some of the Withdrawal group may have benefited from assistance in improving their reading skills. It would be of value to obtain information from the students to determine whether or not such assistance might have enabled some of them to persist in their studies. Miller's (1974) study would suggest that a follow-up of those who withdrew may provide additional insights about students' needs and/or causes for withdrawing from school that are not revealed through ex post facto analyses.

The General Information subtest was designed to measure a

broad range of cultural knowledge/experience. The significant difference between the groups on this subtest tended to suggest that the Persisters may have been exposed to, or sought a broader range of cultural experiences. It may be that the majority of Persisters came from homes which encouraged, or had more ready access to, participation in a broad range of such experiences. If this were so, it would provide a partial explanation for the difference in the General Information subtest.

In developing the discriminant analysis equation, it was decided to use only those measures on which the groups differed significantly. This decision resulted in the use of two measures of academic ability and none of the non-academic measures. By way of contrast, Burton's (1972) study was based entirely on non-academic measures. It is possible that the use of all measures, academic and non-academic, might have improved the efficacy of the equation obtained. An alternative to the procedure employed would be to perform a step-wise discriminant analysis. This latter procedure would select out the most statistically significant variables to be included in an equation. However, the step-wise procedure necessitates the use of a computer program which was not available.

The significant discriminant function obtained tended to support the findings of Plapp, Prathas, and Caputo (1965) with regard to the use of measures of academic ability in predicting success in a diploma school of nursing.

Although there were no significant differences between the groups on the non-academic measures in this study, other investigators have reported significant findings, e.g. Thurston,

Brunclik, and Feldhusen (1969), Burton (1972) and Reece (1961). Of these studies, Reece's was based on data from the Edwards Personal Preference Schedule. While Reece did not specify differences between students who completed their program of studies and those who withdrew, the data he presented indicated that some differences existed. On the other hand, Adams and Klein (1970) have suggested that the Edwards Personal Preference Schedule may not be an appropriate measure of non-academic variables. They reported several inconsistencies in studies based on the Edwards Personal Preference Schedule and recommended that the use of other non-academic measures such as Cattell's Sixteen Personality Factors Test be explored.

Some of the articles reviewed made reference to a paper by Summerskill in which he suggested that academic problems may reflect a student's inability to cope with, or adjust to, some of the non-academic demands of the program in which a student may be enrolled.

Many of the studies tended to support Summerskill's position, e.g. Adams and Klein (1970), Burton (1972), Reece (1961) and Thurston, et al (1969). However, the results of the present study did not appear to support Summerskill. The abbreviated form of the Edwards Personal Preference Schedule used in the present study was not utilized in selecting students for the School of Nursing and thus was administered on a one-time basis. Subsequent administrations of the instrument may have revealed differences between Persisters and Withdrawals and may have tended to support Summerskill.

SUMMARY

The purpose of this study was to determine the variables which would differentiate the members of the Class of 1975 who persisted in the School of Nursing from those who withdrew from school during the 1973-74 school year.

The variables examined included: high school rank, University of Missouri-Kansas City grade-point-average, and the academic and non-academic measures on the Psychological Corporation's Entrance Examination for Schools of Nursing.

The persisters group was composed of 61 members of the Class of 1975 who had matriculated as Freshmen in the School of Nursing. The Withdrawal group was composed of 24 members of the same class, five of whom matriculated at the beginning of the 1973-74 school year.

In addition to determining differences, a discriminant function was calculated for the purpose of identifying potential withdrawals.

The results were summarized as follows:

- There was no significant difference in average high school rank between the groups.
- The Persisters had a significantly higher UMKC grade-point-average.
- The Persisters had significantly higher mean scores on two of the seven measures of academic ability on the Psychological Corporation exam.
- The discriminant function significantly differentiated between members of the criterion group (Class of 1975) and the cross-validation group (Class of 1976).

In general, the results tended to support previous studies regarding the use of measures of academic achievement/ability in predicting success, or persistence, in school. However, the

results did not support previous findings based on the use of measures of non-academic variables.

RECOMMENDATIONS

The following recommendations are based upon the results of this study and on the literature reviewed:

- That the discriminant function be applied to the Class of 1977 for further cross-validation.
- That those members of the Classes of 1976 and 1977, identified as potential withdrawals by the discriminant function, be interviewed to determine needs they have which, if met, would enhance the likelihood of their completing school.
- That the information obtained from the interviews be referred to the appropriate Faculty committee for study and implementation.
- That other measures of non-academic variables be explored for potential research purposes. Examples of measures of non-academic variables include: Cattell's Sixteen Personality Test, the Adjective Check List, the Tennessee Self-Concept Questionnaire, and the Omnibus Personality Inventory.
- That a questionnaire be developed and sent to students who have withdrawn to determine what additional assistance that School could have provided them to aid them in pursuing their goals. This information could be compared with the interview results and perhaps provide suggestions for future programs for students.

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